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EXAMINER	
MICHALSKI, JUSTIN I	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 02/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/753,167	AYLWARD, J. RICHARD	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 7 claims an acoustic waveguide having a closed end and said acoustic port positioned between said first acoustic driver and said closed end of said acoustic waveguide. Applicant is requested to show where matter can be found as originally disclosed in specification and drawings.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1-4, 6, 8, 9, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka (US Patent 4,933,982).

Regarding Claim 1, Tanaka discloses an electro acoustic waveguide system (Figure 4), comprising: an acoustic waveguide (Interior of figure 4 and figure 5) having

an open end (left side of figure 5) and an interior (top of interior of figure 4): a first acoustic driver (speaker 20) having a first radiating surface (surface radiating outward of figure 4) and a second radiating surface (surface radiating inward of figure 4), constructed and arranged so that said first radiating surface radiates sound waves into free air and sad second radiating surface radiates sound waves into said acoustic waveguide so that sound waves are radiated at said open end: and a source of opposing sound waves in said acoustic waveguide (duct 10) for opposing a predetermined spectral component of said sound waves radiated into said acoustic waveguide to oppose the acoustic radiation of said predetermined spectral component from said acoustic waveguide (Tanaka discloses that certain frequencies traveling through duct 10 will have opposite phase and cancel each other out (i.e. oppose acoustic radiation) (Column 2, lines 10-16).

Regarding Claim 2, Tanaka further discloses an acoustic port, coupling said interior with free air (Left side of figure 5).

Regarding Claim 3, Tanaka further discloses predetermined spectral component comprises the opposition frequency (spectral component frequency is determined by equation 1 of Column 1).

Regarding Claim 4, Tanaka further discloses said source of opposing sound waves comprising a reflective surface inside said acoustic waveguide, positioned so that sound waves reflected from said reflected surface oppose said sound waves radiated directly into said acoustic waveguide by said second radiating surface (Sound waves are reflected off of walls of duct 10 in figure 5).

Regarding Claim 6, Tanaka further discloses an acoustic port coupling said interior with free air (Left side of figure 5).

Regarding Claim 8, Tanaka further discloses predetermined spectral component comprises a dip frequency at which said waveguide system produces an acoustic null, absent said source of opposing sound waves (Tanaka discloses that certain frequencies traveling through duct 10 will have opposite phase and cancel each other out (i.e. dip frequency) (Column 2, lines 10-16).

Regarding Claim 9, Tanaka further discloses source of opposing sound waves comprises a reflective surface inside said acoustic waveguide, positioned so that sound waves reflected from said reflected surface opposes said sound waves radiated directly into said acoustic waveguide by said second radiating surface (Sound waves are reflected off of walls of duct 10 in figure 5 opposing waves radiated by speaker 20).

Regarding Claim 23, Tanaka discloses an electroacoustic waveguide system (Figure 4) comprising: an acoustic waveguide having a substantially constant cross section; and a plurality of acoustic drivers placed in said acoustic waveguide (Speaker 20 and duct 10) so at least two of said acoustic drivers are substantially 0.5L apart where L is the effective length of the waveguide (Speaker 20 is substantially 0.5L from duct 10 where L is the height of the waveguide enclosure 30).

Regarding Claim 24, Tanaka further discloses driver 20 is placed at a position substantially 0.25 from said closed end and a second of said acoustic drivers (duct 10) is placed at a position substantially 0.75 from said closed end, where L is the effective length of the waveguide (L is height of the waveguide enclosure 30).

4. Claims 14-16, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Yanagawa (US Patent 4,509,184).

Regarding Claim 14, Yanagawa discloses and electroacoustic waveguide (structure of figure 3a) comprising: an acoustic waveguide having an open end (114 and 117) and a closed end (ends connecting speakers 111 and 112 to tunnels 118 and 119) and a wall connecting said open end and said closed end (structure of 113); a plurality of acoustic drivers (speakers 111 and 112), each having a first radiating surface and a second radiating surface (half radiating into air (115, and 116) and half radiating into tunnels 118 and 119); wherein a first of said acoustic drivers (speaker 111) is placed in said wall of said acoustic waveguide so that said first radiating surface of said first acoustic driver radiates into said acoustic waveguide (half radiating into tunnel 118) and said second radiating surface of said first acoustic driver radiates into free air.

Regarding Claim 15, Yanagawa further discloses a second of said acoustic drivers is positioned in said closed end of said acoustic waveguide (speaker 112 positioned at closed end of tunnel 119).

Regarding Claim 16, Yanagawa further discloses a second of said plurality of acoustic drivers is placed in said wall of said acoustic waveguide so that said first radiating surface of said second driver radiates into said acoustic waveguide (half radiating into tunnel 119) and said second radiating surface of said second acoustic driver radiates into free air.

Regarding Claim 20, Yanagawa discloses an electroacoustic waveguide system (Figure 3a) comprising: an acoustic waveguide (113) having an open end (114) and a closed end (end near speaker 111 connecting tunnel 118) and an effective midpoint (between speakers 111 and 112); a plurality of acoustic divers (speakers 111 and 112); and an acoustic compliance acoustically coupling a first of said plurality of acoustic drivers and said acoustic waveguide (It is inherent that air would provide an acoustic compliance for coupling an acoustic driver to a waveguide).

Regarding Claim 21, Yanagawa further discloses first of said plurality of acoustic drivers (speaker 111) is positioned at approximately effective midpoint.

5. Claims 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Takayama et al. (US Patent 6,002,781).

Regarding Claim 18, Takayama et al. discloses an electroacoustic waveguide system (Figure 1) comprising: an acoustic waveguide opening window 8; an acoustic driver (speaker 7); and an acoustic low-pass filter (Filter 6) intercoupling said acoustic driver and said acoustic waveguide.

Regarding Claim 19, Takayama et al. further discloses said acoustic low pass filter comprises an acoustic compliance between said acoustic driver and said acoustic waveguide (It is inherent that an acoustic driver would have an acoustic compliance such as the properties of air).

6. Claims 11, and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hersh et al. (US Patent 6,201,872).

Regarding Claim 11, Hersh discloses an acoustic waveguide system (Figure 6) comprising: an acoustic waveguide (Structure of figure 6) having an open end (Right end) and a closed end (Axial Fan end) and further having an effective length; an acoustic driver (Helmholtz resonators) for radiating sound waves into said waveguide, positioned in said acoustic waveguide so that there is an acoustic null at the said open end at a dip frequency (Hersh et al. discloses helmholtz resonator arrays drive at an appropriate amplitude and phase for cancellation of a node (i.e. cause an acoustic null and prevent frequency from reaching the open end) (Column 2, lines 30-39).

Regarding Claim 25, Hersh et al. discloses a method for operating an acoustic waveguide (Figure 6) having an open end (Right end) and a closed end (Axial Fan end) and a wall connecting said open end and said closed end (Walls connecting axial fan to flow straightener), comprising, radiating acoustic energy into said acoustic waveguide (Rotor Axial Fan); and significantly opposing acoustic radiation at a predetermined dip frequency (Hersh et al. discloses helmholtz resonator arrays drive at an appropriate amplitude and phase) (Column 2, lines 30-39).

Regarding Claim 26, Hersh et al. further discloses opposing acoustic radiation in said acoustic waveguide (Hersh et al. discloses helmholtz resonator arrays drive at an appropriate amplitude and phase (i.e. opposing radiation)) (Column 2, lines 30-39).

Regarding Claim 27, Hersh et al. further discloses providing opposing acoustic radiation comprises reflecting said radiated acoustic energy off an acoustically reflective

surface inside said acoustic waveguide so that said reflected acoustic energy opposes the acoustic energy radiated into said waveguide (Figure 6 discloses the waveguide consisting of walls which would reflect acoustic energy inside acoustic waveguide).

Regarding Claim 28, Hersh et al. further discloses providing opposing acoustic radiation comprises radiating, by a second acoustic driver, said opposing acoustic energy into said acoustic waveguide (Hersh et al. discloses helmholtz resonators (Figure 6) (i.e. second driver) arrays drive at an appropriate amplitude and phase for cancellation of a node) (Column 2, lines 30-39).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as applied to claim 1 above in view of Hersh et al. (US Patent 6,201,872). Tanaka discloses a system as stated apropos of claim 1 above but does not disclose source of opposing sound waves comprises a second acoustic driver arranged and constructed to radiated sound waves into the acoustic waveguide. Hersh et al. discloses an acoustic waveguide (Figure 6) which includes acoustic drivers (helmholtz resonators) used to produce an appropriate amplitude and phase to cancel the component of a single mode

in order to an unwanted noise component (Column 4, lines 36-37, 44-46, and 8-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a second driver to produce an opposing sound wave to cancel an unwanted frequency of sound.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as applied to claim 8 above in view of Hersh et al. (US Patent 6,201,872). Tanaka discloses a system as stated apropos of claim 8 above but does not disclose source of opposing sound waves comprises a second acoustic driver arranged and constructed to radiated sound waves into the acoustic waveguide. Hersh et al. discloses an acoustic waveguide (Figure 6) which includes acoustic drivers (helmholtz resonators) used to produce an appropriate amplitude and phase into the waveguide to cancel the component of a single mode in order to an unwanted noise component (Column 4, lines 36-37, 44-46, and 8-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a second driver to produce an opposing sound wave to cancel an unwanted frequency of sound.

10. Claims 12 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hersh et al. as applied to claim 11 above in view of Koyano et al. (US Patent 5,590,208).

Regarding Claim 12, Hersh et al. discloses a system as stated above apropos of claim 11 but does not disclose the driver being substantially 0.25L from the closed end where L is the effective length of said waveguide. Koyano et al. discloses a waveguide (Figure 1a) with a speaker (20) positioned substantially 0.25 from the closed end (wall 16) of the guide. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a driver could be place at substantially 0.25L from the closed end of a waveguide.

Regarding Claim 13, Tanaka further discloses figure 4 which is a sectional view of a bass reflex speaker. The speaker would inherently internally reflect sound waves within the enclosure including frequencies at said dip frequency.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa as applied to claim 14 above in view of Hersh et al. (US patent 6,201,872). Yanagawa discloses a system as stated above apropos of claim 14. Yanagawa does not disclose acoustic drivers producing a null at the open end of waveguide. Hersh et al. discloses a waveguide (Figure 6) including a plurality of drivers (helmholtz resonators) configured to cancel the cosine component of a single mode (i.e. null frequency) (Column 4, lines 44-46). Hersh et al. teaches that this method can cancel out unwanted frequencies (Column 2, lines 20-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a plurality of drivers to cancel out an unwanted frequency for a more customized audio output.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagawa as applied to claim 20 above, and further in view of Tanaka (US Patent 4,933,982). Yanagawa discloses a system as stated apropos of claim 20 above but does not disclose the distance of the drivers being substantially 0.25L and 0.75L from the closed end where L is the effective length of the waveguide. Tanaka discloses a waveguide system (Figure 4) with a driver 20 is placed at a position substantially 0.25 from said closed end (top of enclosure 30) and a second of said acoustic drivers (duct 10) is placed at a position substantially 0.75 from said closed end, where L is the effective length of the waveguide (L is height of the waveguide enclosure 30). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that two drivers could have been placed at substantially 0.25L and 0.75L from the closed end of the waveguide in order to produce an appropriate acoustic response such as frequency cancellation (Tanaka, Column 2, lines 14-15).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

SPE, AU 2644

JIM